TM 11-4059

WAR DEPARTMENT TECHNICAL MANUAL

INTERPHONE AMPLIFIERS

BC-367 AND BC-667

REPAIR INSTRUCTIONS

WARNING: The material forming the subject matter of this manual is the property of the United States Government and it is printed and distributed solely for the use of the military, naval, and civilian personnel of the War and Navy Departments, and may not be published or reproduced in whole or in part in any manner or form (except by lawful copyright holders who may reproduce their copyrighted material in its original form) except upon specific approval by authorized military public relations agencies.

WAR DEPARTMENT • *OCTOBER 1945*

WAR DEPARTMENT TECHNICAL MANUAL

TM 11-4059

INTERPHONE AMPLIFIERS

BC-367 AND BC-667

REPAIR INSTRUCTIONS

WAR DEPARTMENT • OCTOBER 1945

WARNING: The material forming the subject matter of this manual is the property of the United States Government and it is printed and distributed solely for the use of the military, naval, and civilian personnel of the War and Navy Departments, and may not be published or reproduced in whole or in part in any manner or form (except by lawful copyright holders who may reproduce their copyrighted material in its original form) except upon specific approval by authorized military public relations agencies.

United States Government Printing Office
Washington: 1945

WAR DEPARTMENT
Washington 25, D. C., 26 October 1945

TM 11–4059, Interphone Amplifiers BC–367 and BC–667, Repair Instructions, is published for the information and guidance of all concerned.

[AG 300.7 (9 Oct 45)]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL
Chief of Staff

OFFICIAL:
EDWARD F. WITSELL
Major General
Acting The Adjutant General

DISTRIBUTION:

AAF (5); AGF (5); ASF (2); T of Opns (5); Dept (2); Base Comd (2); Island Comd (2); Arm & Sv Bd (1); S Div ASF (1); Tech Sv (2); Sv C (2); Air Tech Sv C (2); Dep 11 (2); Lab 11 (2); 4th Ech Maint Shops 11 (2); 5th Ech Maint Shops 11 (2); T/O–E 11–107(3); 11–127(3); 11–587(3); 11–592(3); 11–597(3).

Refer to FM 21–6 for explanation of distribution formula.

CONTENTS

SECTION I. DESCRIPTION OF INTERPHONE AMPLIFIERS BC–367 AND BC–667.	Paragraph	Page
Use of equipment	1	1
Characteristics	2	1
Over-all system function	3	1
II. DIFFERENCES BETWEEN MODELS.		
Dynamotor differences	4	2
Other differences	5	2
III. INITIAL REPAIR PROCEDURES.		
General	6	3
Tools, test and cleaning equipment	7	3
Removal of chassis from box	8	4
Removal of dynamotor	9	4
Removal of tubes	10	4
Chassis cleaning and inspection	11	4
Cleaning and testing of tubes	12	5
IV. PRELIMINARY TROUBLE-SHOOTING PROCEDURES.		
Output voltage test	13	6
Input resistance test	14	6
Operating test	15	6
V. ALIGNMENT PROCEDURE.		
VI. DETAILED TROUBLE-SHOOTING PROCEDURES.		
General	16	8
Tube tests	17	8
Voltage tests	18	8
Resistance tests	19	8
Point-to-point check	20	8
Moistureproofing and fungiproofing	21	8
Refinishing and painting	22	9
VII. FINAL TESTING.		
General	23	10
Amplifier voltage output test	24	10
Amplifier output impedance test	25	10
Amplifier output distortion test	26	10
Amplifier linearity test	27	11
Oscillator output test	28	11
Oscillator frequency test	29	11
Operational test	30	11
VIII. INDIVIDUAL STAGE AND CIRCUIT REPAIR DATA.		
Amplifier stage	31	12
Oscillator stage	32	14
Dynamotor stage	33	15
IX. SUPPLEMENTARY DATA.		
Parts identification	34	16

SAFETY NOTICE

This equipment uses voltages which are high enough to cause severe shock if contacted by the operating personnel. Extreme caution should be exercised when working in the equipment.

Figure 1. Interphone Amplifier BC–367 or BC–667.

SECTION I

DESCRIPTION OF INTERPHONE AMPLIFIERS BC–367 AND BC–667*

1. Use of Equipment (figs. 1 and 3)

Interphone Amplifiers BC–367 and BC–667 are used in Interphone Equipment RC–99, a multistation interphone equipment, which allows communication among the crew members of medium tank M3. These equipments also permit the radio operator and tank commander to retain partial control of the tank radio for voice communication with stations outside of the tank.

2. Characteristics

Interphone Amplifier BC–367 or BC–667, contains two separate circuits, oscillator and amplifier. The oscillator generates a 600-cycle signal. The amplifier has a rated output of 2 watts.

3. Over-all System Function (figs. 2 and 5)

The amplifier is of the transformer-coupled type. The output from the speech amplifier is impressed across the output transformer. The oscillator generates an audio signal which the driver of the tank may use to indicate that he wishes to speak to someone on the radio side of the system. The audio signal is impressed across the input of the second audio of Radio Receiver BC–312–( ), or across the output of Radio Receiver BC–683–( ), BC–603–( ), or BC–652, depending on which one of these receivers is being used. Switching of the interphone amplifier from one function to another is accomplished in Control Box BC–739–A, another component of Interphone Equipment RC–99.

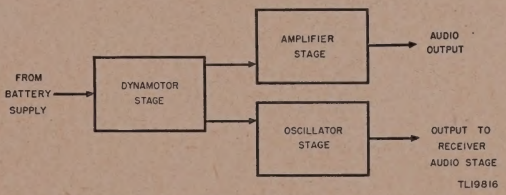


Figure 2. Interphone Amplifier BC–367 or BC–667—block diagram.

*See TM 11–702 for installation, operation, and other maintenance data on this equipment.

SECTION II

DIFFERENCES BETWEEN MODELS

4. Dynamotor Differences

The dynamotor used in Interphone Amplifier BC–367 has a 12-volt input and a 250-volt output, while the dynamotor used in Interphone Amplifier BC–667 has a 24-volt input and a 250-volt output.

5. Other Differences

All minor differences are covered in section VIII.

SECTION III

INITIAL REPAIR PROCEDURES

Note. Before any repairs or adjustments are made, all authorized modification work orders must be applied. See FM 21–6 for list of applicable MWO's.

6. General

Maintenance personnel should follow the procedure outlined in this manual when repairing and overhauling Interphone Amplifier BC–367 or BC–667. The repair information in this and the following sections is presented in the order in which the repairman should actually perform the various operations on the equipment in the repair shop. This procedure permits repair of the equipment in the shortest time possible, resulting in performance comparable to that of new equipment.

7. Tools, Test and Cleaning Equipment

Below are listed the tools, test and cleaning equipment required for repair and overhaul of this equipment.

Item	*Description*
Audio-frequency oscillator	Standard, with metered output, 100 to 5,000 cycles.
Tube tester	Dynamic type.
Voltohmmeter	Ranges: 0 to 3/10/30/100/300/1,000 a-c and d-c volts. 0.1 ohm to 100 megohms (such as I–56–(*)).
Meter, output	Ranges: 0 to 6/15/60/150 a-c volts. (4,000 ohm constant impedance.)
Oscilloscope	3″ to 5″ screen.
Resistors	1,500, 2,500, 5,000, and 8,000 ohms, 5 watts.
Microphone	T–30–( ) or T–17.
Interphone Amplifier BC–367 or BC–667	Approved sample.
Headset	P–19 or HS–18.
Vise, padded	8″ to 10″ jaw.
Screwdrivers	⅛″, ¼″ x 6″.
Pliers	Long-nose; diagonal.
Mirrors	Dental.
Probing light	Penlite or equal.
Small brushes	1½″, 1″, 2″, Bristol width.
Pipe cleaners	
Lint-free cloths	6″ x 6″.
Masking tape	1″ width.
Varnish	
Solvent, dry-cleaning	Cleaning fluid.
Sandpaper	#000 and #0000.

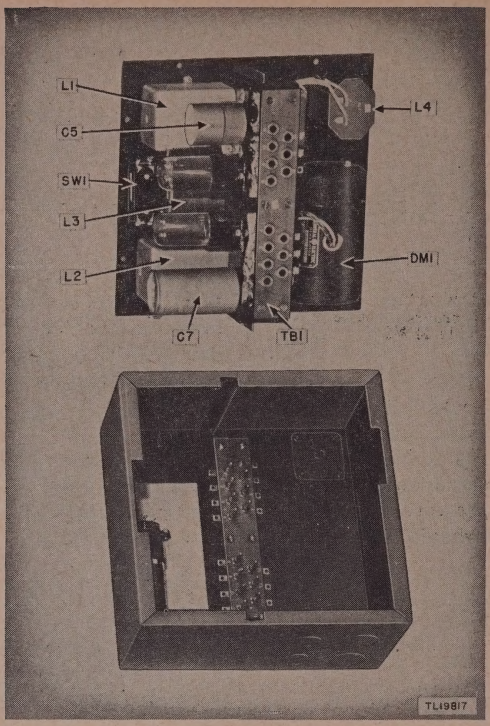


Figure 3. Interphone Amplifier BC–367 or BC–667, box and chassis.

8. Removal of Chassis from Box

Unscrew the eight screws which secure the panel to the box. Place the set, with its panel up, in a padded vise. Tighten vise, and remove chassis by pulling firmly on the handles on the panel.

9. Removal of Dynamotor

Unscrew the dynamotor and terminal board mounting screws. Place the chassis on a padded bench with the panel down, place the dynamotor on the bench at the side of the chassis, and bend the terminal board up and away from the chassis. (See fig. 4.)

10. Removal of Tubes

Remove Tubes JAN–6V6 or JAN–6V6–GT from the chassis sockets and from the spare socket at the top of the box.

11. Chassis Cleaning and Inspection

Check the chassis for cleanliness, inside and outside. Observe condition of the finish and plating. Both paint and plating should be free of corrosion, blisters, flaking, bare or worn spots, and deep scratches. Inspect shock mountings for tears or holes. Check switch SW1 (figs. 1 and 3) and volume control R4 for smooth operation. There should be no appreciable backlash or slipping, and switch should snap firmly into position. Hardware such as bolts, nuts, screws, plugs, and sockets should be tight. Check for broken or poorly soldered joints. Replace badly corroded and damaged parts. Remove slight corrosion with sandpaper. Tighten (replace if necessary), all loose hardware. Clean all parts with a cloth, brush, or pipe cleaner dampened with dry-cleaning solvent (SD).

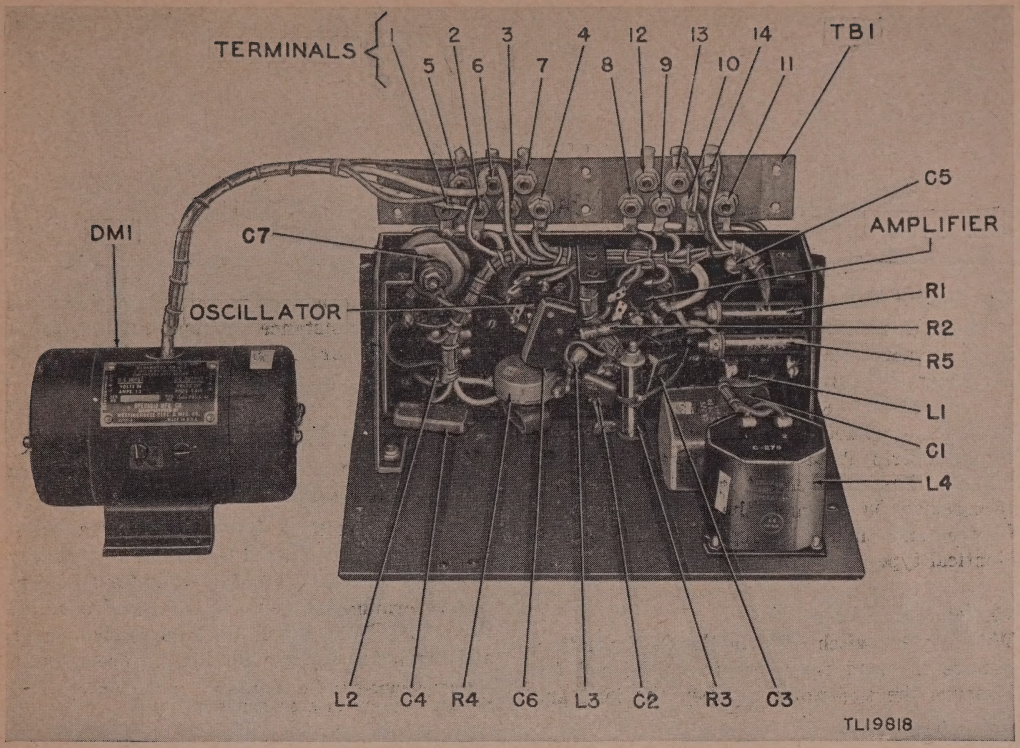


Figure 4. Interphone Amplifier BC–367 or BC–667, chassis partly disassembled.

12. Cleaning and Testing of Tubes

Replace badly corroded and damaged Tubes JAN–6V6 or JAN–6V6–GT. Remove slight corrosion with sandpaper, and wipe clean with cloth dampened in dry-cleaning solvent (SD). Clean glass envelope with water moistened cloth. In either case polish and dry with cloth. Insert tubes one at a time in proper socket in tube tester. Set controls as directed by chart accompanying tester. Test for short circuits, emission, transconductance, and power output. If readings are below standard, or if readings fluctuate when tube is tapped, replace tube.

SECTION IV

PRELIMINARY TROUBLE-SHOOTING PROCEDURES

13. Output Voltage Test

With tubes removed from their sockets, place a jumper across terminals 1 and 7 of Terminal Strip (female) TB1. (See figs. 4 and 10.) Apply 12-volt (if BC–367) or 24-volt (if BC–667) battery output across terminals 1 and 2 of the terminal strip. Read voltage between terminals 5 and 1. The requirement is 290 volts. If this requirement is not met, the dynamotor is defective, and should be replaced with one of identical type.

14. Input Resistance Test

With power switch SW1 in the OFF position, remove the lead from terminal 2 of coil L4. Measure the resistance between the lead and ground; the resistance at this point should be infinite. If resistance is not infinite, check capacitor C3 or C4 or coil L4 for possible defects.

15. Operating Test

a. PLUGGING IN REMOVED PARTS. Return tubes to their sockets.

b. CONNECTION OF EXTERNAL POWER UNIT. Reconnect all unsoldered leads. Connect battery (12 volts for BC–367 and 24 volts for BC–667) across terminals 1 (–) and 2 (+) of terminal Strip TB1. Turn switch SW1 on. Watch, smell, and listen for any peculiarities in operation.

Note. Fungiproofed sets may smoke unduly even though they are in good condition.

SECTION V

ALIGNMENT PROCEDURE

(Not applicable)

SECTION VI

DETAILED TROUBLE-SHOOTING PROCEDURES

16. General

The purpose of this section is to describe the procedure for localizing trouble to one particular stage, and ultimately, to the defective unit part. This procedure is indicated in step-by-step form in paragraphs 17 through 19. Procedure is also given for moistureproofing and fungiproofing, and refinishing the equipment.

17. Tube Tests

Inasmuch as the tubes have been used since they were tested last, and the average tube tester provides a simulated check, tubes should be given a comparative operational test. This is desirable in order to avoid the possibility that the tubes may have become defective in use. Then, in order to make a comparative test, for operational performance, install the tubes in a similar piece of equipment in good working order. Insert tubes one at a time and observe equipment performance. If the operation of the equipment is adversely affected, the tube or tubes are defective.

18. Voltage Tests

a. CONDITIONS FOR TESTS.

(1) Tubes must be in sockets.

(2) Jumper should be placed across terminals 1 and 7 of Terminal Strip (female) TB1.

(3) Batteries (12 volts for BC–367 and 24 volts for BC–667) must be connected to terminals 1 and 2 of Terminal Strip TB1.

(4) Volume control R4 must be turned to maximum.

(5) Power switch SW1 must be turned to ON position.

b. MEASUREMENTS. Measure the d-c voltage between each of the tube socket terminals and chassis (ground). Variations of more than 10 percent from the values given in figure 5 should be investigated for defective circuit. Now measure the voltage between terminal 5 of Terminal Strip TB1 and chassis (ground). A variation of more than 10 percent from the required value of 250 volts indicates a defective dynamotor.

19. Resistance Tests

a. CONDITIONS FOR TESTS.

(1) Tubes removed.

(2) Jumper removed from terminals 1 and 7 of Terminal Strip TB1.

(3) Power switch turned to OFF.

(4) Volume control R4 turned to maximum.

b. MEASUREMENTS. Measure the resistance between the tube socket pins and chassis (ground). Variations of more than 10 percent from the values given in figure 5 may indicate a defective circuit, make resistance test of component parts within circuit to locate defective part, as explained in paragraph 20.

20. Point-to-Point Check

a. GENERAL. Upon location of trouble in a particular stage, point-to-point measurements should be made in order to locate the defective unit parts. These measurements are made with an ohmmeter, and defective component parts must be replaced with identical parts. Before resistance measurements are made on an individual part, check the schematic diagram (fig. 9) to be sure that no other parts are connected to the one being tested as they will affect the resistance reading. If necessary, disconnect one terminal of the part under test to isolate it.

b. AMPLIFIER CIRCUIT. Check capacitors C1, C2, C4, and C5 for dielectric leakage and/or short circuits. Check coils L1 and L2 for continuity and resistors R1, R2, and R4 for d-c resistance value.

c. OSCILLATOR CIRCUIT. Check capacitors C3 and C6 for dielectric leakage and/or short circuits. Check coil L3 for continuity and resistor R3 (also R5 in BC–667) for d-c resistance value.

d. DYNAMOTOR CIRCUIT. Check capacitor C7 for short circuit. Check coil L4 and the windings of the dynamotor for continuity.

21. Moistureproofing and Fungiproofing

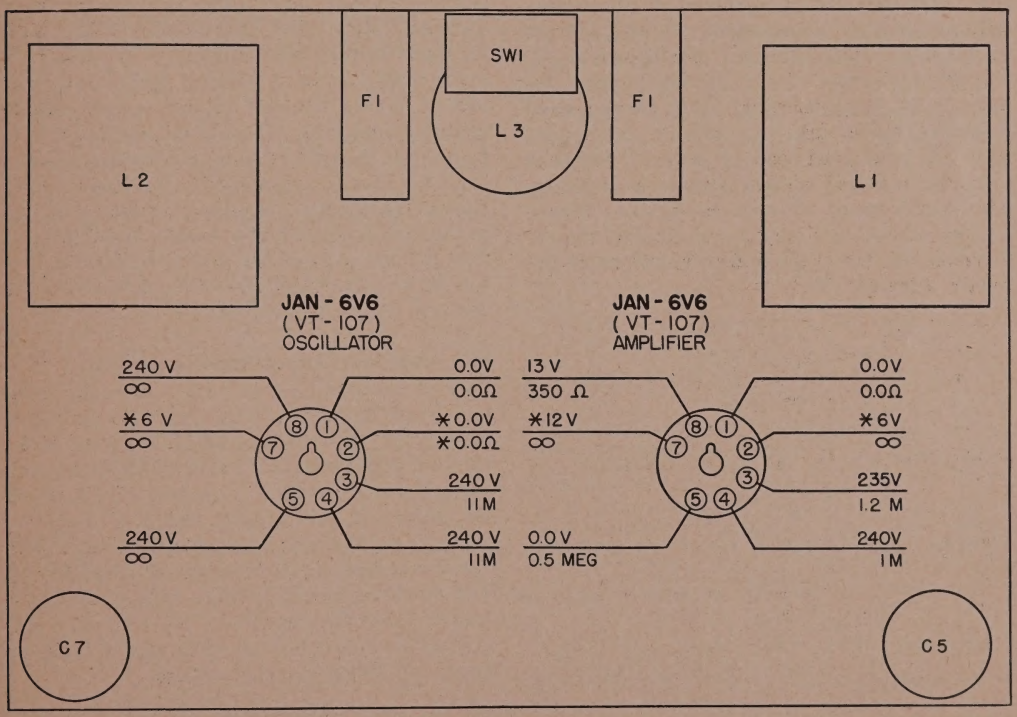
When repairing equipment which has been treated with moistureproofing and fungiproofing varnish, it is necessary to clean the varnish

from all connections which are to be soldered. After completing the repairs, apply the moistureproofing varnish with a brush to the repaired connections and to all other parts from which the coating was removed. Avoid applying varnish to any points where electrical contacts are made and broken, such as switches, jacks, binding posts, tube caps, and socket connections. Mask these points. If the date of moistureproofing and fungiproofing marked on the equipment shows that it has been more than 6 months since the treatment was applied, it will be necessary to repeat the entire moistureproofing and fungiproofing process. Instructions for this process are contained in TB SIG 13.

22. Refinishing and Painting

Where the finish on the case has been badly scarred or damaged, it is necessary to refinish it in order to prevent further corrosion. Remove all rough spots using #000 or #0000 sandpaper, and clean surface down to metal. Obtain a bright smooth finish. Rust may be removed from the case by cleaning it with dry-cleaning solvent (SD). In severe cases, it may be necessary to use carbon tetrachloride to soften up the rust and then sandpaper, alternating until the rust has been removed. Paint treat spots with a small brush, or if bare areas are extensive, spray-paint the entire case.

Caution: The use of steel wool, while it does permit quick removal of rust, is not recommended. Its use allows small particles of metal to enter the case, with consequent damage to the equipment due to shorting or grounding of circuits.



* THESE VALUES ARE FOR BC-367. FOR BC-667 THE VALUES ARE:

OSCILLATOR:
PIN NO.2 - 11.5V, 25Ω
PIN NO.7 - 17.6V

AMPLIFIER:
PIN NO.2 - 17.6V
PIN NO.7 - 24 V

NOTE:
M=1,000 Ω

TL19819

Figure 5. Interphone Amplifier BC–367 or BC–667, voltage and resistance measurements.

SECTION VII

FINAL TESTING

23. General

The information provided in this section contains minimum requirements for final tests of Interphone Amplifiers BC–367 and BC–667. Make the tests in accordance with the instructions as given for each requirement in this section. The table below includes all test value with expectant requirement values. Values given in this table for test are approximate. Variation tolerance of ±10 percent for requirement value is permissible. When comparative tests are made, use a substitute component known to be in good working order. Equipment properly repaired should approach performance requirement of new equipment. Where equipment does not meet requirements, the repairman will locate the difficulty, and make the repair. (See sec. VI.)

Test	Input voltage (rms)	Input frequency (cps)	Resistive load (ohms)	Requirement
Amplifier voltage output.	0.5 max	300 1,000 4,000	2,500	30 volts rms min output 75 volts rms min output 60 volts rms min output
Amplifier output impedance.	0.5	1,000	1,500 5,000	50 volts rms min output 100 volts rms min output
Amplifier output peaks.	0.5	Between 300 and 8,000	2,500	95 volts rms max output
Amplifier linearity	0.25	1,000	2,500	35 volts rms min output
Oscillator output	----------	----------	8,000	22 volts rms min output

24. Amplifier Voltage Output Test

With appropriate dynamotor connected to Terminal Strip TB1 and a battery (12-volt for BC–367) and 24-volt for BC–667), across terminals 1 and 2, connect a 2,500-ohm, 5-watt resistor in parallel with an output voltage meter (alternating-current (a-c) voltmeter) across amplifier output terminals 1 and 8 of Terminal Strip TB1. (See figs. 4 and 9.) Connect a standard audio-frequency (a-f) oscillator with metered output across the microphone amplifier input terminals 11 and 6 of Terminal Strip TB1. Close switch SW1. With an input voltage not exceeding 0.5 volts rms, make tests at 300, 1,000 and 4,000 cycles per second (cps). Set the volume control R4 to maximum position. The output voltage should be not less than 30 volts for 300 cycles, 75 volts for 1,000 cycles, and 60 volts for 4,000 cycles. Repeat test with a-f oscillator across input terminals 14 and 6, 10 and 6, and 13 and 6 in turn. Use all four microphone windings for the first test. If uniform output is obtained, use only one channel for subsequent tests.

25. Amplifier Output Impedance Test

Connect a-f oscillator to either microphone input winding, and output meter to amplifier output. Set the oscillator at 1,000 cycles. Make the test with resistance loads of 1,500 ohms (5 watts) and 5,000 ohms, (5 watts) across amplifier output at terminals 1 and 2 of Terminal Strip TB1. The amplifier output voltage with resistance load of 1,500 ohms should be 50 volts. The amplifier output voltage with a resistance load of 5,000 ohms should be 100 volts. The output voltages are for 0.5 volts signal input to any of the microphone windings.

26. Amplifier Output Distortion Test

Apply a 0.5-volt signal from the audio oscillator to any microphone input winding. Make the test with any frequency between 300 and 8,000 cycles. The amplifier output voltage, when measured with output voltage meter and resis-

tance load of 2,500 ohms (5 watts), should not be greater than 95 volts. Now, replace the output voltage meter with an oscilloscope. Connect the test leads to the vertical plate connection of the oscilloscope. Set the controls of the oscilloscope, in accordance with individual instructions furnished with each instrument, to produce waveform pattern on screen. Make this test with a signal of 0.5 volts at 1,000 cycles, having less than 1 percent distortion, on any microphone input winding of amplifier. There should be no perceptible distortion of the sine wave as viewed on the scope.

27. Amplifier Linearity Test

Apply a 0.25-volt, 100 cycle, signal from audio oscillator to any microphone input winding. Connect a load resistor of 2,500 ohms (5 watt) across the amplifier output. The amplifier output as measured with output voltmeter should not be less than 35 volts with above signal input value.

28. Oscillator Output Test

Connect terminals 1 and 9 of Terminal Strip TB1. Place the voltmeter in parallel with an 8,000-ohm, 5-watt resistor across output terminals 3 and 1. The output should be not less than 22 volts.

29. Oscillator Frequency Test

Replace the output-voltage meter with the vertical plate connections of an oscilloscope. Impress the audio-oscillator output on the horizontal plates of the oscilloscope. Adjust the frequency of the audio-oscillator output until the Lissajou's figure indicates a ratio of one to one between the frequencies impressed on the horizontal and vertical plates. Read the frequency of the audio oscillator. It should be not less than 500 cps nor greater than 1,000 cps.

30. Operational Test

Place Microphone T–30–( ) or T–17 across the amplifier input terminals. Place Headset P–19 or HS–18 across the amplifier output terminals. Use the 2,500-ohm output impedance. Adjust amplifier volume control R4 so that when microphone is spoken into forcefully, the headset will not chatter. The amplifier output signal should be as clear and intelligible as that obtained when using an approved sample. There should be no audio oscillation generated even momentarily when the microphone switch is depressed. Upon completion of each test, restore equipment to normal for further use.

SECTION VIII

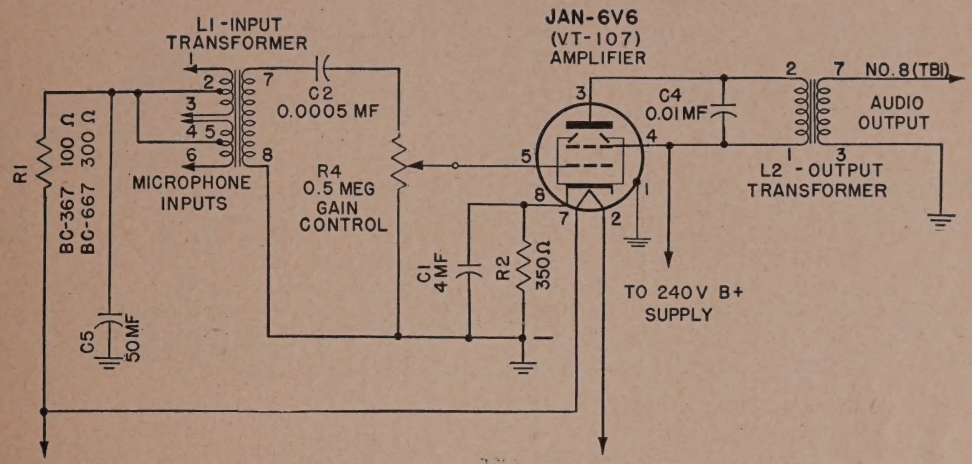
INDIVIDUAL STAGE AND CIRCUIT REPAIR DATA

31. Amplifier Stage

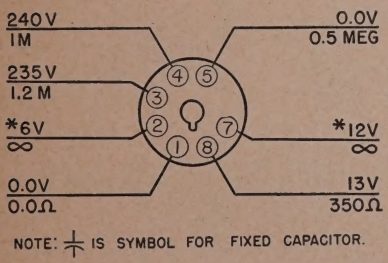
a. GENERAL. The amplifier has a rising characteristic from 100 cycles to 2,500 cycles (attenuation at lower frequencies), which tends to compensate for the poor high-frequency response of Microphone T–30–A and prevent excessive noise pick-up. The input transformer consists of a two-winding primary with each winding center tapped, and a single-winding secondary. The a-f voltage, after being stepped up by the input transformer, is applied through a potentiometer volume control to the grid of amplifier Tube JAN–6V6 (VT–107). The output of this tube appears across the secondary of the output transformer. Various output impedances of this transformer can be obtained by use of the proper tap. The amplifier is shipped with an output impedance of 2,500 ohms in use. The d-c microphone current is obtained from a car-battery source (12 volts in BC-367 and 24 volts in BC-667) through a dropping resistor (100 ohms in BC-367 and 100 ohms in BC-667). A 50 microfarad (mf), 25-volt, electrolytic capacitor bypasses the a-c component of the microphone current through the dropping resistor, as shown in figure 6.

b. PARTS DATA FOR AMPLIFIER STAGE (fig. 6).

Ref symbol	Signal Corps stock No.	Name of part and description	Function
C1	3D275	CAPACITOR CA–275: fixed; paper; 4.0–mf; 50 vdcw	Bias capacitor.
C2	3D193	CAPACITOR CA–193: fixed; mica; 0.0005–mf; 250 vdcw	Blocking capacitor.
C4	3D353	CAPACITOR CA–353: fixed; paper; 0.01–mf; 400 vdcw	Bypass capacitor.
C3	3D308	CAPACITOR CA–308: electrolytic; 50–mf; 25 vdcw	Bypass capacitor.
L1	2Z9653	TRANSFORMER C–253: Primary resistance, terminals 1–3 and 4–6 70 ohms max; turns ratio of secondary winding to each primary winding is 10 to 1.	Input transformer.
L2	2Z9855	TRANSFORMER C–255: Primary resistance 210 ohms max; secondary resistance, terminals 3–7, 190 ohms max.	Output transformer.
R1 (BC–367)	3Z4642	RESISTOR RS–242: wire-wound; 100–ohm; 8–w	Dropping resistor.
R1 (BC–667)	3Z4653	RESISTOR RS–253: wire-wound; 300–ohm; 10–w	Dropping resistor.
R2	3Z9844	RESISTOR RS–244: moulded; 350–ohm; 1–w	Bias resistor.
R4	2Z7285–1	POTENTIOMETER RS–239: Linear; 500,000–ohm	Gain control.
	2Z8659–6	SOCKET: 8-prong; octal	Tube socket.
	2T107	TUBE: JAN–6V6 (VT–107); RCA 6V6, or equal	Amplifier.



*THESE VALUES ARE FOR BC-367. FOR BC-667 THE VALUES ARE:
PIN NO. 2 - 17.6 V
PIN NO. 7 - 24 V



CONDITIONS FOR TESTS:

VOLTAGE MEASUREMENTS:

TUBES MUST BE IN SOCKETS.

JUMPER SHOULD BE PLACED ACROSS TERMINALS 1 AND 7 OF TERMINAL STRIP (FEMALE) TBI.

BATTERIES MUST BE CONNECTED TO TERMINALS 1 AND 2 OF TERMINAL STRIP TBI.

VOLUME CONTROL R4 MUST BE TURNED TO MAXIMUM.

POWER SWITCH SW1 MUST BE TURNED TO ON POSITION.

MEASURE THE D-C VOLTAGE BETWEEN EACH OF THE TUBE SOCKET TERMINALS AND CHASSIS (GROUND).

RESISTANCE MEASUREMENTS:

TUBES REMOVED.

LEAD REMOVED FROM TERMINAL 2 OF COIL L4.

POWER SWITCH TURNED TO OFF.

VOLUME CONTROL R4 TURNED TO MAXIMUM.

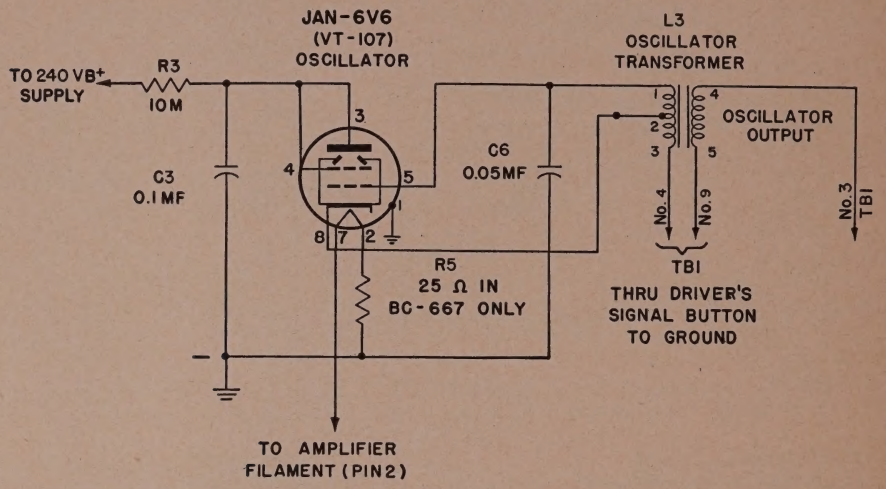
MEASURE THE RESISTANCE BETWEEN THE TUBE SOCKET PINS AND CHASSIS (GROUND).

TL19820

Figure 6. Interphone Amplifier BC-367 or BC-667, amplifier stage.

32. Oscillator Stage

a. GENERAL. In the oscillator circuit, the grid is inductively coupled to the plate, and tuned by a 0.05-mf capacitor between the grid and ground. Tube JAN–6V6 (VT–107) is a beam-power amplifier with screen and plate connected to form a triode. The oscillator transformer has a secondary winding which is connected to the output of the radio receiver. (See fig. 7.)



CONDITIONS FOR TESTS:

VOLTAGE MEASUREMENTS

TUBES MUST BE IN SOCKETS.

JUMPER SHOULD BE PLACED ACROSS TERMINALS 1 AND 7 OF TERMINAL STRIP (FEMALE) TB 1.

BATTERIES MUST BE CONNECTED TO TERMINALS 1 AND 2 OF TERMINAL STRIP TB 1.

VOLUME CONTROL R4 MUST BE TURNED TO MAXIMUM.

POWER SWITCH SW 1 MUST BE TURNED TO ON POSITION.

MEASURE THE D-C VOLTAGE BETWEEN EACH OF THE TUBE SOCKET TERMINALS AND CHASSIS (GROUND).

RESISTANCE MEASUREMENTS

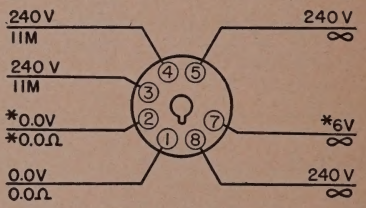
TUBES REMOVED.

LEAD REMOVED FROM TERMINAL 2 OF COIL L 4.

POWER SWITCH TURNED TO OFF.

VOLUME CONTROL R4 TURNED TO MAXIMUM.

MEASURE THE RESISTANCE BETWEEN THE TUBE SOCKET PINS AND CHASSIS (GROUND).



* THESE VALUES ARE FOR BC-367. FOR BC-667 THE VALUES ARE:
PIN NO.2 – 11.5V, 25 Ω
PIN NO.7 – 17.6V

NOTE: ⊣⊢ IS SYMBOL FOR FIXED CAPACITOR.
M=1,000 Ω

TL19821

Figure 7. Interphone Amplifier BC–367 or BC–667, oscillator stage.

b. PARTS DATA FOR OSCILLATOR STAGE (fig. 7).

Ref symbol	Signal Corps stock No.	Name of part and description	Function
C3	3D277	CAPACITOR CA–277: fixed; paper; 0.1–mf; 400 vdcw	Filter capacitor.
C6	3D284	CAPACITOR CA–284: fixed; paper; 0.05–mf; 400 vdcw	Oscillator tuning capacitor.
L3	2Z9854	TRANSFORMER C–254: primary resistance, terminals 1–2, 45 ohms max; terminals 2–3, 115 ohms max; secondary resistance, terminals 4–5, 215 ohms max.	Oscillator transformer.
R3	3Z4643	RESISTOR RS–243: wire-wound; 10,000–ohm; 8–w	Dropping resistor.
R5 (BC–667)	3Z4652	RESISTOR RS–252: wire-wound; 25–ohm; 10–w	Dropping resistor.
	2Z8659–6	SOCKET: 8-prong, octal	Tube socket.
	2T107	TUBE: JAN–6V6 (VT–107); RCA 6V6, or equal	Oscillator.

33. Dynamotor Stage

a. GENERAL. The plate and screen voltage for both the amplifier and oscillator circuits are obtained by the use of a dynamotor mounted on the front panel of the interphone amplifier chassis. The filaments of Tubes JAN–6V6 (VT–107) are connected in series across the battery supply (through a 25-ohm dropping resistor in BC–667). The negative battery terminal of the dynamotor is kept above ground potential, and used as the dynamotor control lead. Depressing the microphone switch connects the lead to ground, thus starting the dynamotor. A filter unit, consisting of a 10 henry (h) choke coil with a 2-mf paper capacitor across the lead side, is mounted on the front panel of the interphone amplifier chassis and provides d-c voltage for the tube plates and screens. (See fig. 8.)

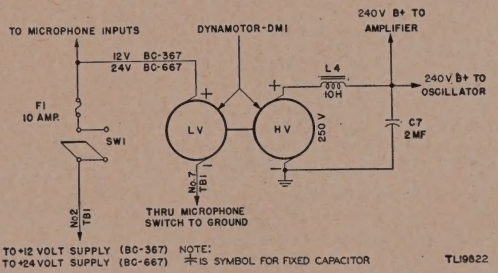


Figure 8. Interphone Amplifier BC–367 or BC–667, dynamotor stage.

b. PARTS DATA FOR DYNAMOTOR STAGE.

Ref symbol	Signal Corps stock No.	Name of part and description	Function
C7	3D374	CAPACITOR CA–374: fixed; paper; 2.0–mf; 600 vdcw	Filter capacitor.
DM1 (BC–367)	3H1625–( )	DYNAMOTOR DM–25–A: 12-v input; 0.05–amp 250–v output.	Plate supply.
DM1 (BC–667)	3H1645–( )	DYNAMOTOR DM–45–A: 24-v input; 0.05–amp 250–v output.	Plate supply.
L4	3C279	COIL C–279: iron core, 10 henrys; 50 ma; 500 ohms max	Filter choke
SW1	3Z8151	SWITCH SW–151: toggle DPST	Power switch.
	3Z1921–A	FUSE FU–21–A: 10-amp; 25–v; 5–sec. delay	Supply fuse.

SECTION IX

SUPPLEMENTARY DATA

34. Parts Identification

The following illustrations are provided to aid in identifying and servicing the various component parts of Interphone Amplifiers BC–367 and BC–667.

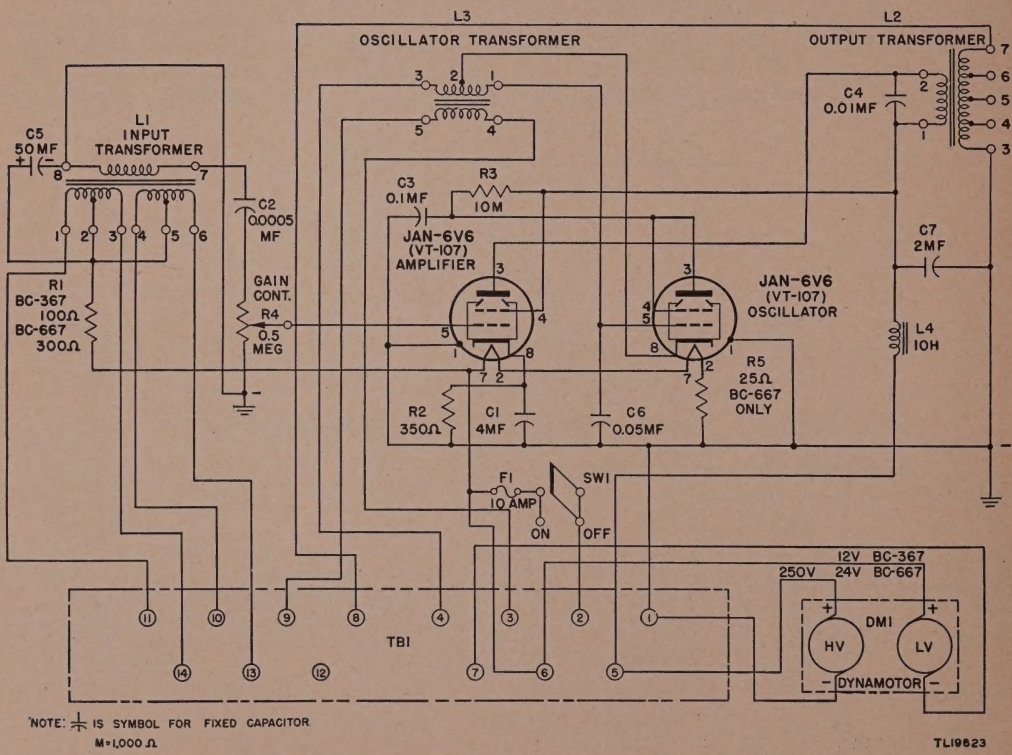


Figure 9. Interphone Amplifier BC–367 or BC–667—schematic diagram.

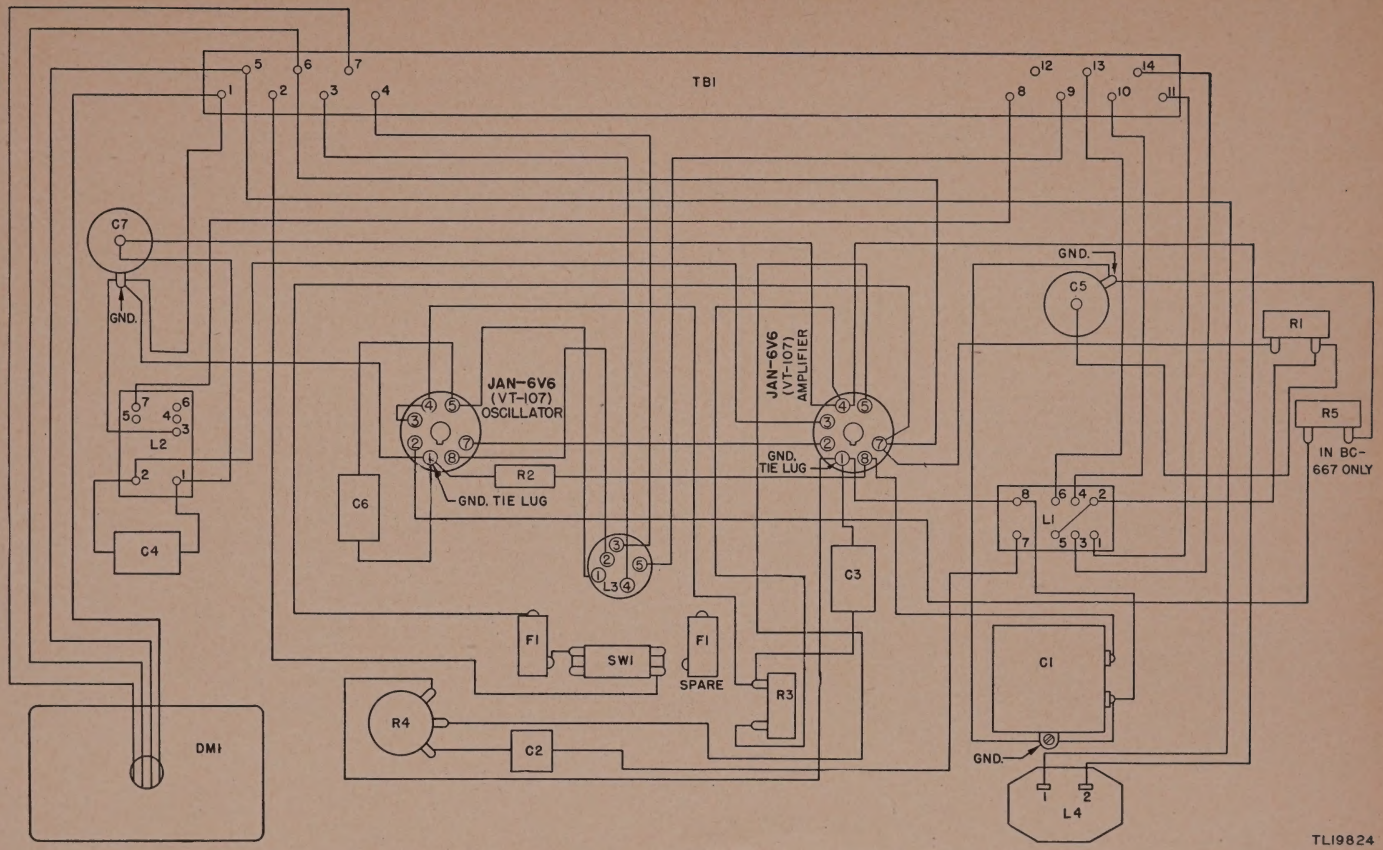


Figure 10. Interphone Amplifier BC–367 or BC–667—practical wiring diagram.

☆ U. S. Government Printing Office: 1945—671414